

Application No. 09/194,367

Document: "AMENDMENT AFTER ALLOWANCE"

REMARKS/ARGUMENTS

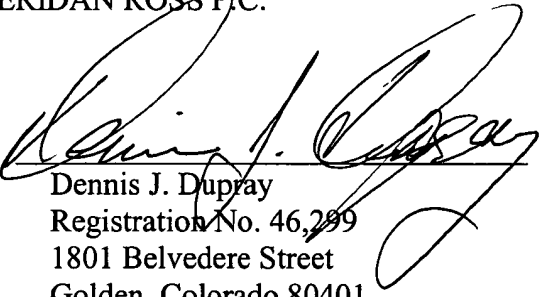
Attached hereto is a marked up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version With Markings to Show Changes Made."

It is believed that no fees are due with the present transmittal. However, in the event that such fees are due, Applicants request a telephone call to the Applicant listed hereinbelow.

Respectfully submitted,

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Sept. 17, 2001

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification:

The paragraph beginning on page 22, line 14 has been amended as follows:

Figs. 9A and 9B [Fig. 9 is a] are high level data structure diagrams describing the fields of a location hypothesis object generated by the first order models 1224 of the location center.

The paragraph beginning on page 79, line 266 has been amended as follows:

Input: hypothesis: MS location hypothesis;
measured_loc_sig_bag: A collection of measured location signatures ("loc sigs" for short) obtained from the MS (the data structure here is an aggregation such as an array or list). Note, it is assumed that there is at most one loc sig here per Base Station in this collection. Additionally, note that the input data structure here may be a location signature cluster such as the "loc_sig_cluster" field of a location hypothesis (cf. Figs. 9A and 9B). Note that variations in input data structures may be accepted here by utilization of flag or tag bits as one skilled in the art will appreciate;
search_criteria: The criteria for searching the verified location signature data base for various categories of loc sigs. The only limitation on the types of categories that may be provided here is that, to be useful, each category should have meaningful number of loc sigs in the location signature data base. The following categories included here are illustrative, but others are contemplated:
 (a) "USE ALL LOC SIGS IN DB" (the default),
 (b) "USE ONLY REPEATABLE LOC SIGS",
 (c) "USE ONLY LOC SIGS WITH SIMILAR TIME OF DAY".
Further categories of loc sigs close to the MS estimate of "hypothesis" contemplated are: all loc sigs for the same season and same time of day, all loc sigs during a specific weather condition (e.g., snowing) and at the same time of day, as well as other limitations for other environmental conditions such as traffic patterns. Note, if this parameter is NIL, then (a) is assumed.

The paragraph beginning on page 85, line 5 has been amended as follows:

This function creates a new list of location hypotheses from the input list, "loc_hyp_list", wherein the location hypotheses on the new list are modified versions of

those on the input list. For each location hypothesis on the input list, one or more corresponding location hypotheses will be on the output list. Such corresponding output location hypotheses will differ from their associated input location hypothesis by one or more of the following: (a) the "image_area" field (see Figs. 9A and 9B) may be assigned an area indicative of where the target MS is estimated to be, (b) if "image_area" is assigned, then the "confidence" field will be the confidence that the target MS is located in the area for "image_area", (c) if there are not sufficient "nearby" verified location signature clusters in the location signature data base 1320 to entirely rely on a computed confidence using such verified location signature clusters, then two location hypotheses (having reduced confidences) will be returned, one having a reduced computed confidence (for "image_area") using the verified clusters in the Location Signature data base, and one being substantially the same as the associated input location hypothesis except that the confidence (for the field "area_est") is reduced to reflect the confidence in its paired location hypothesis having a computed confidence for "image_area". Note also, in some cases, the location hypotheses on the input list, may have no change to its confidence or the area to which the confidence applies.

The paragraph beginning on page 89, line 18 has been amended as follows:

(35.5) A location extrapolator module 1432 for use in updating previous location estimates for a target MS when a more recent location hypothesis is provided to the location hypothesis analyzer 1332. That is, assume that the control module 1400 receives a new location hypothesis for a target MS for which there are also one or more previous location hypotheses that either have been recently processed (i.e., they reside in the MS status repository 1338, as shown best in Fig. 6), or are currently being processed (i.e., they reside in the run-time location hypothesis storage area 1410). Accordingly, if the active_timestamp (see Figs. 9A and 9B regarding location hypothesis data fields) of the newly received location hypothesis is sufficiently more recent than the active_timestamp of one of these previous location hypotheses, then an extrapolation may be performed by the location extrapolator module 1432 on such previous location hypotheses so that all target MS location hypotheses being concurrently analyzed are presumed to include target MS location estimates for substantially the same point in time. Thus, initial location estimates generated by the FOMs using different wireless signal measurements, from different signal transmission time intervals, may have their corresponding dependent location hypotheses utilized simultaneously for determining a most likely target MS location estimate. Note that this module may also be daemon or expert system rule base.

The paragraph beginning on page 143, line 13 has been amended as follows:

Input: **hypothesis:** MS location hypothesis;
measured_loc_sig_bag: A collection of measured location signatures ("loc

sigs" for short) obtained from the MS (the data structure here is an aggregation such as an array or list). Note, it is assumed that there is at most one loc sig here per Base Station in this collection. Additionally, note that the input data structure here may be a location signature cluster such as the "loc_sig_cluster" field of a location hypothesis (cf. Figs. 9A and 9B). Note that variations in input data structures may be accepted here by utilization of flag or tag bits as one skilled in the art will appreciate;

search_criteria: The criteria for searching the verified location signature data base for various categories of loc sigs. The only limitation on the types of categories that may be provided here is that, to be useful, each category should have meaningful number of loc sigs in the location signature data base. The following categories included here are illustrative, but others are contemplated:

- (a) "USE ALL LOC SIGS IN DB" (the default),
- (b) "USE ONLY REPEATABLE LOC SIGS",
- (c) "USE ONLY LOC SIGS WITH SIMILAR TIME OF DAY".

Further categories of loc sigs close to the MS estimate of "hypothesis" contemplated are: all loc sigs for the same season and same time of day, all loc sigs during a specific weather condition (e.g., snowing) and at the same time of day, as well as other limitations for other environmental conditions such as traffic patterns. Note, if this parameter is NIL, then (a) is assumed.

The paragraph beginning on page 161, line 8 has been amended as follows:

This function creates a new list of location hypotheses from the input list, "loc_hyp_list", wherein the location hypotheses on the new list are modified versions of those on the input list. For each location hypothesis on the input list, one or more corresponding location hypotheses will be on the output list. Such corresponding output location hypotheses will differ from their associated input location hypothesis by one or more of the following: (a) the "image_area" field (see Figs. 9A and 9B) may be assigned an area indicative of where the target MS is estimated to be, (b) if "image_area" is assigned, then the "confidence" field will be the confidence that the target MS is located in the area for "image_area", (c) if there are not sufficient "nearby" verified location signature clusters in the location signature data base to entirely rely on a computed confidence using such verified location signature clusters, then two location hypotheses (having reduced confidences) will be returned, one having a reduced computed confidence (for "image_area") using the verified clusters in the Location Signature DB, and one being substantially the same as the associated input location hypothesis except that the confidence (for the field "area_est") is reduced to

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reflect the confidence in its paired location hypothesis having a computed confidence for "image_area". Note also, in some cases, the location hypotheses on the input list, may have no change to its confidence or the area to which the confidence applies. Note that the steps herein are also provided in flowchart form in Figs. 25a and 25b.

The paragraph beginning on page 162, line 10 has been amended as follows:

else /* the location hypothesis can (and will) be modified; in particular, an "image_area" may be assigned, the "confidence" changed to reflect a confidence in the target MS being in the "image_area". Additionally, in some cases, more than one location hypothesis may be generated from "loc_hyp[i]". See the comments on FIGS. 9A and 9B and the comments for "get_adjusted_loc_hyp_list_for" for a description of the terms here. */